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CCFSS News August 2000

Wei-Wen Yu Center for Cold-Formed Steel Structures

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CCFSS NEWS

Center for Cold-Formed Steel Structures at the University of Missouri-Rolla

E-mail: ccfss@umr.edu; <http://www.umr.edu/~ccfss>

Butler-Carlton Civil Engineering Hall
1870 Miner Circle
Rolla, MO 65409-0030
Telephone: 573-341-4471
Fax: 573-341-4476

Director: Wei-Wen Yu, Ph.D., P.E.

Associate Director: Roger A. LaBoube, Ph.D., P.E.

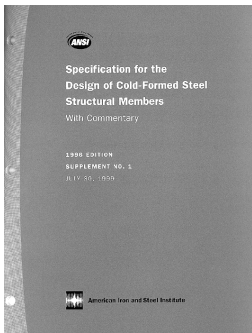
Volume 11, Number 1

August 2000

New AISI Publications

Supplement No. 1 to the 1996 Specification

The American Iron and Steel Institute has recently published its *Supplement No. 1 to the 1996 Edition of the Specification for the Design of Cold-Formed Steel Structural Members with Commentary*. Both the 1996 edition of the *Specification with Commentary* and *Supplement No. 1* have been approved by American National Standards Institute (ANSI) as a national standard.



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The contents of this Supplement were briefly discussed in an article entitled "Preview of the AISI Supplement to the 1996 Edition of the Specification", appearing in the August 1999 issue of the *CCFSS Technical Bulletin*, Vol. 8, No. 2. In addition, it includes a revised commentary and the following two appendixes:

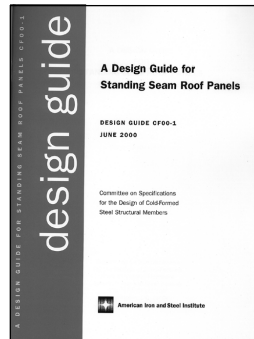
Appendix A: Base Test Method for Purlins Supporting a Standing Seam Roof System

Appendix B: Standard Procedures for Panel and Anchor Structural Tests

To order the publication, please call 1-800-277-3850 in US and Canada and call 1-410-810-0880 (or fax: 410-810-0910) in other regions, and refer to publication number: SG-2000-1.

Design Guide for Standing Seam Roof Panels

A new *Design Guide for Standing Seam*



Roof Panels, Design Guide CF00-1, June 2000, has recently been published by the American Iron and Steel Institute. It provides information to the designer of standing seam roof panels and detailed discussions on how to use recently

published AISI test procedure "Standard Procedures for Panel and Anchor Structural Tests" to design standing seam roof panels under wind uplift. This Guide is based on the AISI 1996 *Specification for the Design of Cold-Formed Steel Structural Members* and *Supplement No. 1*. Where the *Specification* is silent on design issues, the procedures are based on published references and on the opinions of the authors. The table of contents of the *Design Guide* is provided as follows:

1. Introduction and Background
2. Architectural and Structural Roof Systems
3. Review of Cold-Formed Steel Panel Design Requirements
4. Panel Design
5. Clip Design
6. Other Design Considerations
7. Systems Subjected to Gravity Loading
8. Systems Subjected to Uplift Loading
9. Design Examples
10. References

Appendix I: AISI Standard Procedures for Panel and Anchor Structural Tests with Commentary

Appendix II: ASTM E1992-95,

Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference

Appendix III: Inspection and Maintenance of Standing Seam Roof

The Guide was developed by Dr. James M. Fisher and Mr. Leonard Lewandowski of Computerized Structural Design, Inc., and Dr. Roger A. LaBoube of the University of Missouri-Rolla. It was co-sponsored by the American Iron and Steel Institute and the Metal Building Manufacturers Association.

To order the publication, please call 1-800-277-3850 in US and Canada and call 1-410-810-0880 (or fax: 410-810-0910) in other regions, and refer to publication number CF00-1.

CCFSS Website Update

The Center's Website (<http://www.umr.edu/~ccfss>) has recently been updated. Available topics include: About the Center; Location and Organization; Calendar; Center Sponsorship; AISI Slide Talk; AISI Specifications and Standards; Computer Programs; Continuing Education and Seminars; Library and Classifications; Scholarships and Fellowships; Newsletters and Bulletins; Publications and Proceedings; Research and Abstracts; and textbook on Cold-Formed Steel Design.

Under the title of "Library and Classifications", a link has been established to the Center's Technical Library database. Books and other technical resources may be searched through this automated catalog.

AISI Committee on Framing Standards Update

By Jay Larson, Bethlehem Steel

The AISI Committee on Framing Standards (COFS) and its subcommittees met in Las Vegas, NV on May 2 and 3 in conjunction with the AWCI annual conference. The subcommittees met again in Chicago, IL on July 18 and 19.

Within the COFS, work continues towards completing several standards already under development, including (1) General Provisions for the Construction of Cold-Formed Steel Framing; (2) Standard for Cold-Formed Steel Construction of One and Two Family Dwellings; (3) Design Standard for Cold-Formed Steel Truss Construction; (4) Double L-Header Design Standard; and (5) Box and Back-to-Back Header Design Standard. Work is also being initiated on the development of the

prescriptive high wind and high seismic design standards for residential construction.

Once completed, the above documents will form a solid foundation from which the COFS and the light-gauge steel framing industry can build.

The COFS develops and maintains consensus standards for cold-formed steel framing. The COFS mission is to eliminate regulatory barriers and increase the reliability and cost competitiveness of cold-formed steel framing in residential and commercial building construction. For more information, please contact the AISI, Kevin Bielat (202-452-7215) or Mosunmola Adeboyeku (202-452-7119), or check the AISI website (<http://www.steel.org/construction/framing/>).

AISI COS Met in Toronto

The AISI Committee on Specifications for the Design of Cold-Formed Steel Structural Members and its subcommittees held their meetings in Toronto, Canada on July 27 - 29, 2000. On July 26, a workshop on the Direct Strength Method was conducted by Ben Schafer at the University of Toronto. For details, see page 3.

Prior to the subcommittee and main committee meetings, the Committee on North American Specifications held its meeting on July 27, followed by a series of research reports presented by Ben Schafer, Teoman Pekoz, Reini Schuster, Tom Murray, Jim Fisher, Steve Fox, and Greg Hancock.

As in previous meetings, all subcommittees reviewed their ballots and identified future research projects for consideration of the Subcommittee on Strategic Planning and Research. Seven ballots were approved by the Committee including (a) addition of a new term "master coil" in Section A1.2 with revisions of the required number of full section tests (Section F3.1) and the required number of tensile specimens taken from each master coil for establishing virgin steel properties (Section F3.3); (b) clarification of the Commentary on Section A6.1.1 regarding the reduced target reliability index used for secondary flexural members subjected to a combination of dead and wind loads; (c) revision of the design equations for determining the web crippling strength of flexural members (Section C3.4); (d) format change of the equation for determining the slenderness factor in Section B2.1 for uniformly compressed stiffened elements; (e) addition of design provisions for point-symmetric sections to be used as concentrically loaded compression members; (f) addition of design requirements to limit each individual ratio to not exceed unity in all interaction equations of Section C5.2; and (g) addition of new design provisions for cyclic loading (fatigue).

The next meeting of the Committee on Specifications will be held in February 2001.

Metal Construction Association

The Metal Construction Association recently held its 17th Semi-Annual Meeting in St. Louis, MO. The program included a Mid-Year State of the Association report by MCA President Bill Hippard; updates of numerous activities of various councils and committees; a presentation by Don Moody, President of the North American Steel Framing Council; and an introductory keynote address by John Oldfield of the Conference Board on the breakthrough e-business and information technology practices for U.S. and European countries.

METALCON International 2000

METALCON 2000, planned for Atlanta, GA on October 31 - November 2, will introduce a number of new activities including a new schedule, new product demonstrations, new seminars on product utilization, and the MCA Merit Awards and President's Award Winners of the annual MCA design competition.

a. Product Demonstration - The MCA Councils will present product demonstrations at METALCON International to emphasize the important qualities that each of these products can offer in architectural design, as well as ease

of installation, low maintenance, excellent life cycle costs, strength, durability and other important considerations.

b. Seminar on Diaphragm Design - A seminar on diaphragm design will be presented by Dr. Larry Luttrell, Professor Emeritus of West Virginia University. This seminar is sponsored by the MCA Technical Advisory and Coordinating Committee to inform architects, designers and engineers on the findings of the MCA - sponsored research project. A comprehensive report on the research program will be provided for more effective diaphragm design practices in the metal-in-construction field.

c. Student Design Competition - Winners of the MCA Student Design Competition for the design of Chicago Transit System Elevated Station have been selected by the distinguished jury, consisting of Larry Booth, James C. Jankowski, Ralph Johnson and Jim Hagle. Winners are: 1st Prize - Julie Wagner (Illinois Institute of Technology); 2nd Prize - John Frank and Chad Stinnett (Kansas State University); 3rd Prize - George Matos (Illinois Institute of Technology); Honorable Mention - Kristina Hahn (University of Utah).

Personal News

Reidar Bjorhovde Receives Shortridge Hardesty Award for 2000

The Structural Engineering Institute of the American Society of Civil Engineers (ASCE) has announced that Dr. Reidar Bjorhovde is the recipient of the Shortridge Hardesty Award for 2000. Named for prominent American structural engineer Shortridge Hardesty, the award is given to an individual who has contributed substantially in applying fundamental results of research to the solution of practical engineering problems in the field of structural stability.



Dr. Bjorhovde is cited for his scholarly work on column and frame stability as well as load and resistance factor design (LRFD), including the landmark column studies that led to the development of the Structural Stability Research Council (SSRC) column curves. These form the basis for the criteria

in current US, Canadian, Australian and South African codes for the design of steel structures. Bjorhovde is also cited for his leadership role in a number of ASCE, American Institute of Steel Construction (AISC) and American Iron and Steel Institute (AISI) research and design development efforts.

A Fellow of ASCE, Bjorhovde received doctoral degrees from the Norwegian Institute of Technology in Trondheim, Norway, and Lehigh University in Bethlehem, Pennsylvania. He is President of The Bjorhovde Group, a consulting firm and international engineering consortium located in Tucson, Arizona. His career includes professorships at the University of Alberta, University of Arizona and the University of Pittsburgh.

Bjorhovde has received numerous honors in the past, including the T.R. Higgins lectureship of AISC, the J. James R. Croes Medal of ASCE, the Duggan Medal of the Engineering Institute of Canada, the NATO

Senior Guest Scientist award for work in France, and the prestigious Research Fellowship of the Japan Society for the Promotion of Science. He is further recognized through inclusion in a number of editions of *Who's Who* and similar publications.

Dr. Bjorhovde has been a member of the AISI Committee on Specifications for many years. The Center for Cold-Formed Steel Structures congratulates him for this well-deserved honor.

Workshop on Direct Strength Method Offered by Ben Schafer

A workshop on Finite Strip Analysis and the Direct Strength Method was conducted by Dr. Ben Schafer in Toronto on July 26, 2000 in conjunction with the meetings of the AISI Committee on Specifications. The goal of the course was to insure that the participants understood how to perform their own analysis for the elastic buckling stress of cold-formed steel members using the finite strip method as implemented in a freely available software.

The workshop covered the following topics:

- Discussion of the background for the finite strip method.
- Performance of a verification problem to gain some confidence in the results, with an introduction to the software.
- Interpretation of the results to find the plate buckling coefficient, the buckling stress, the buckling load or moment.
- Analysis of a typical cold-formed steel section under a variety of different loads and interpretation of the results.
- Use of the results of finite strip analysis to predict the strength of members.
- Limitations of the method and the details needed in modeling.
- Analysis of a selected model and possible improvements in the geometry.

Wei-Wen Yu Updates Textbook on Cold-Formed Steel Design

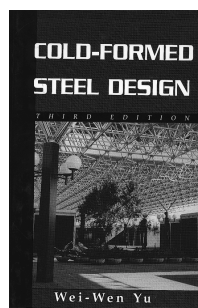
The Third Edition of the textbook *Cold-Formed Steel Design* (ISBN 0-471-34809-0), by Wei-Wen Yu, was published by John Wiley & Sons, Inc. in June 2000. Dr. Yu is Curators' Professor Emeritus of Civil Engineering and Director of the Center for Cold-Formed Steel Structures at the University of Missouri-Rolla.

This newly-revised book is based on the 1996 Edition of the American Iron and Steel Institute (AISI) *Specification for the Design of Cold-Formed Steel Structural Members* with the 1999 Supplement. It reflects all the important developments that have occurred in the field of cold-formed steel structures over the past decade.

The 756-page book features a complete coverage of the design of cold-formed steel

structural members, connections, and assemblies using both the allowable stress design (ASD) and load and resistance factor design (LRFD) methods. All chapters have been completely updated and expanded according to the available information. In addition, a new chapter has been added for residential construction.

Copies of the book may be purchased at a discount price from the Center for Cold-Formed Steel Structures, Room 219, Butler-Carlton Civil Engineering Hall, University of Missouri-Rolla, Rolla, MO 65409-0030 USA (Telephone: 573-341-4471; Fax: 573-341-4476; e-mail: ccfss@umr.edu). The order form can be found at the Center's Website (<http://www.umr.edu/~ccfss>).



Third International Conference on Thin-Walled Structures

The Third International Conference on Thin-Walled Structures will be held in Cracow, Poland on June 5-7, 2001. It is organized by the Department of Strength of Materials and Structures at Technical University of Lodz, Poland, jointly with the Department of Mechanical Engineering at University of Strathclyde, UK and College of Aeronautics at Cranfield University, UK.

The main topics covered in the Conference include the following areas: 1. Aircraft Structures; 2. Bridges; 3. Car

Structures; 4. Cold-Formed Steel Structures; 5. Offshore Structures; 6. Railway Structures; 7. Shells and Pressure Vessels; 8. Ship Structures; 9. Storage Structures (racking, silos); 10. Roof Structures; 11. Perforated Members; 12. Fibrous Composites; 13. Ferrocement Composites; 14. Smart Structures; 15. Buckling and Postbuckling; 16. Buckling Interaction; 17. Ultimate Loading; 18. Progressive Crushing; 19. Impact and Crashworthiness; 20. Material's Aspects in Thin-Walled

Structures (elasto-plasticity, etc.); 21. Innovative Applications; 22. Design Codes and Standards; 23. Finite Element Methods in TWS.

The deadline for submitting abstracts is August 15, 2000. For more information, contact Department of Strength Materials and Structures, Technical University of Lodz, Stefanowskiego Str. 1/15, 90-924, Lodz, Poland. Email: ictws-3@lodz.pl, Tel/ fax: +48 42 631 2217, <http://www.ictws-3.lodz.pl>.

Calendar

October 19-20, 2000
15th International Specialty
Conference on Cold-Formed
Steel Structures
St. Louis, MO
Contact: (573) 341-4481

October 31 - November 2, 2000
METALCON International
Atlanta, GA
Contact: (312) 201-0193

December 5-6, 2000
Meeting of the AISI Committee
on Framing Standards
Baltimore, MD
Contact: (202) 452-7119

February, 2001
Meeting of the AISI Committee
on Specifications
Date and Location TBA
Contact: (202) 452-7130

May 8-11, 2001
SSRC Annual Technical Session
and Meeting
Fort Lauderdale, FL
Contact: (954) 765-5424

May 9-12, 2001
AISC North American Steel
Construction Conference
Fort Lauderdale, FL
Contact: (312) 670-5415

June 5-7, 2001
Third International Conference
on Thin-Walled Structures
Cracow, Poland
Contact: +48-42-631-2217

Center for Cold-Formed Steel Structures
1870 Miner Circle
University of Missouri-Rolla
Rolla, MO 65409-0030 USA

